REMARKS

By the present amendment, claims 6, 9, 16, 21 and 22 have been amended.

Claims 2-7, 9-11, 13-16, and 21-22 are pending in the application. Reconsideration and allowance of all of the claims is respectfully requested in view of the following remarks.

In regard to Rejection of Claims 2-6 and 21 Under 35 USC § 103(a)

The Examiner has rejected claims 2-6 and 21 under 35 U.S.C. § 103(a), as being unpatentable over Wagner, U.S. Patent No. 4,632,216 (hereinafter "Wagner '216"), in view of Badeau, U.S. Patent No. 6,604,604. The Applicants disagree.

The Examiner's attention is directed to the following feature of claim 21:

> a perimeter defined by the active surface in a plane perpendicular to the longitudinal axis, the perimeter increasing with increasing distance from the inlet portion

Referring to page 3 of the rejection, the Examiner has stated that Wagner '216 teaches

> a perimeter defined by the outlet of tube 70, in a plane perpendicular to the longitudinal axis, the perimeter increasing with increasing distance from the inlet portion (which can be deduced from the diagrams of the outlet end (88) of tube 70 in Figs. 4 and 5 and by the formation of the tube by bending, see col. 5 line 58 – col. 6 line 16)[.]

The Applicants disagree with the Examiner's interpretation of Wagner '216, and submit that at least the above feature of claim 21 is not taught by Wagner '216.

Referring to lines 67-2 of columns 1-2 of Wagner '216, it states that:

> [o]ne of the inlet and outlet tubes [...] has a constant perimeter from one end to the other but at one end portion has an inwardly extending crease which mates with a flare at the end of the tube.

Referring also to lines 19-25 of column 2 of Wagner '216, it states that:

> the creased portion not only creates a throat which provides a venturi function, but also does so in a fashion which maintains the constant perimeter of the outlet tube which thereby necessarily on creation of the creased portion and throat enlarges the surrounding expansion chamber's effective volume.

Referring also to lines 40-46 of column 3 of Wagner '216, it states that:

> as shown in FIG. 2, a portion of the lobes 52 and 54 of constricted portion 30 may extend beyond the original cylindrical profile of tube 20. Nevertheless, the perimeter of tube 20 is approximately constant at any particular location between inlet and outlet ends 36 and 40.

Referring also to lines 62-68 of column 3 of Wagner '216, it states that:

> [m]uffler 22' has constricted portions at the inlet end portion of outlet tube 20' and at the outlet end portion of transfer tube 70. Thus, it is understood that the constricted portions may be located on tubes other than the outlet tube and at ends other than the inlet end. The constrictions have a clover leaf shape as shown in FIG. 5 which is similar to the example of FIG. 3C.

It is apparent that Wagner '216 teaches that the tube 20 has a constant perimeter at any particular location between its inlet end 36 and its outlet end 40, including the creased portion 30 of the tube 20. In particular, the tube 20 performs its function "in a fashion which maintains the constant perimeter of the [...] tube". The transfer tube 70 of Wagner '216 has a shape that is similar to that of the tube 20 and as such the transfer tube 70 has a constant perimeter along its entire length, including the creased outlet portion 88. As such, the tube 70 of Wagner '216 has the same perimeter throughout the creased outlet portion 88, and the perimeter of the creased outlet portion 88 is the same as the perimeter of the perforated portion 72 that is not creased. Therefore, Wagner '216 does not teach a perimeter defined by the active surface in a plane perpendicular to the longitudinal axis, the perimeter increasing with increasing distance from the inlet portion.

This deficiency in Wagner '216 is not remedied by Badeau, without admitting that Badeau can be combined with Wagner '216 and reserving the right to argue thereagainst in the future.

Referring to lines 40-44 of column 1 of Badeau, it states that:

> [e]ach cup 18, 20, 22 has an open end 30, 32, 34, respectively, a closed end 36, 38, 40, respectively, and a closed-loop, preferably annular, sidewall 42, 44, 46, respectively, between the respective open end and the respective closed end.

Referring also to Figures 1 and 3 of Badeau, it is apparent that Badeau teaches catalyst-coated perforated cups 18, 20 and 22 having annular side walls 42, 44, 46 respectively, and that the annular side walls 42, 44, 46 each have a constant perimeter along their entire length. Therefore, Badeau does not teach a perimeter defined by the active surface in a plane perpendicular to the longitudinal axis, the perimeter increasing with increasing distance from the inlet portion.

Therefore, at least one feature of claim 21 is not taught by Wagner '216 or Badeau, alone or in combination, which combination is not admitted. As such, the Examiner is requested to withdraw his rejection of claim 21 and claims 2-6 depending therefrom.

In regard to Rejection of Claim 7 Under 35 USC § 103(a)

The Examiner has rejected claim 7 under 35 U.S.C. § 103(a), as being unpatentable over Wagner '216 in view of Badeau, and further in view of Gieshoff, U.S. Patent No. 5,934,073. The Applicants disagree.

Claim 7 is believed to be allowable in view of its dependency from claim 21, for the reasons discussed above with respect to claims 2-6 and 21. Gieshoff is not relevant to the argument made hereinabove with respect to those claims and was not previously cited by the Examiner for that purpose. As such, the Examiner is requested to withdraw his rejection of claim 7.

In regard to Rejection of Claims 9-11, 13, 14, 16 and 22 Under 35 USC § 103(a)

The Examiner has rejected claims 9-11, 13, 14, 16 and 22 under 35 U.S.C. § 103(a), as being unpatentable over Wagner, U.S. Patent No. 5,828,013 (hereinafter "Wagner '013"), in view of Reck, U.S. Patent No. 6,689,327. The Applicants believe the Examiner's rejection has been addressed and overcome by the present amendment.

In response to the Examiner's remarks, the Applicants have amended claim 22.

The Examiner's attention is directed to the following feature of claim 22 as amended:

> a perimeter defined by the active surface in a plane perpendicular to the longitudinal axis, the perimeter increasing with increasing distance from the inlet portion

The Applicants submit that at least the above feature of claim 22 as amended is not taught by Wagner '013.

Referring to lines 54-59 of column 5 of Wagner '013, it states that:

> [t]he inlet tube 22 has a generally cylindrical configuration and is aligned with its central longitudinal axis generally coextensive or coaxial with axis 20. It is noted that end portion 24 of inlet tube 22 is configured in a manner non-cylindrical and described in detail hereinbelow, for advantage.

Referring also to lines 8-14 of column 7 of Wagner '013, it states that:

> [f]or the arrangement shown in FIG. 1, flow distribution element 44 comprises end 24 of tube 22 crimped or folded into a "star" or "four finned" configuration. Such an arrangement has been used in certain types of muffler assemblies before, see for example Wagner et al. '537 referred to above and incorporated herein by reference. In general, the crimping creates closed edges 56 and facilitates flow distribution.

Referring also to Figures 1 and 2 of Wagner '013, it is apparent that the end 24 of the tube 22 of Wagner '013 is formed by beginning with a cylindrical tube 22, i.e. a tube 22 of constant cross-sectional perimeter, and crimping or folding the end 24 of the cylindrical tube 22 into a star configuration. The process of crimping or folding the outlet end 24 of the cylindrical tube 22 of Wagner '013 does not result in the end 24 having a perimeter that increases with increasing distance from the inlet portion, because the cylindrical tube 22 is merely re-shaped by the crimping process, no additional material is added nor is the material from which the tube is formed elastic. Therefore, Wagner '013 does not teach a perimeter defined by the active surface in a plane perpendicular to the longitudinal axis, the perimeter increasing with increasing distance from the inlet portion.

The Applicants submit that Wagner '013 cannot be modified in view of Reck to provide a perimeter defined by the active surface in a plane perpendicular to the longitudinal axis, the perimeter increasing with increasing distance from the inlet portion.

Referring to lines 44-61 of column 5 of Reck, it states that:

> FIG. 7 shows a further advantageous feature of a precatalyst 8 with a downstream main catalytic converter 9. Because of its conical shape, the precatalyst 8 effects an evening out of the flow.
> [...]
> The conical precatalyst 8 favorably has a spread angle of about 7° relative to an imaginary central flow line. Experiments have shown that the flow profile with conical widening also develops a favorable mass transport of the exhaust gas in the peripheral regions of the cone.

It is apparent that Reck teaches a precatalyst 8 having a conical shape widening toward the downstream end with a spread angle of about 7°. This specific shape is required by Reck to provide favorable mass transport of exhaust gas into the catalytic converter 9 of Reck. Wagner '013, for its part, teaches crimping the downstream end of the inlet tube 22 of Wagner '013. As such, Reck and Wagner '013 teach mutually exclusive shapes for inlet tubes of a catalytic converter. The downstream end of the preconverter 8 of Reck cannot be crimped as taught by Wagner '013 without negating the stated advantage of Reck to provide favorable mass transport. The inlet tube 22 of Wagner '013 cannot be made in a widening conical shape as taught by Reck without negating the stated advantage of Wagner '013 to create closed edges 56 and facilitate flow distribution.

Therefore, Reck and Wagner '013 cannot be combined to teach a perimeter defined by the active surface in a plane perpendicular to the longitudinal axis, the perimeter increasing with increasing distance from the inlet portion.

Therefore, at least one feature of claim 22 is not taught by Wagner '013 or Reck, alone or in combination, which combination is denied. As such, the Examiner is requested to withdraw his rejection of claim 22 and claims 9-11, 13, 14 and 16 depending therefrom.

In regard to Rejection of Claim 15 Under 35 USC § 103(a)

The Examiner has rejected claim 15 under 35 U.S.C. § 103(a), as being unpatentable over Wagner '013 in view of Reck, and further in view of Gieshoff, U.S. Patent No. 5,934,073. The Applicants believe that this rejection has been addressed and overcome by the present amendment.

Claim 15 is believed to be allowable in view of its dependency from claim 22, for the reasons discussed above with respect to claims 9-11, 13, 14, 16 and 22. Gieshoff is not relevant to the argument made hereinabove with respect to those claims and was not previously cited by the Examiner for that purpose. As such, the Examiner is requested to withdraw his rejection of claim 15.

Support for Amendment to claim 22

By the present amendment, claim 22 has been amended. The amendment to claim 22 is believed to be supported by the specification originally filed, in particular by paragraph [0033] of the published application:

> The at least one depression 19 is oriented essentially along the axis 14. This arrangement of depressions ensures that as the specific surface grows larger, the internal cross section area of the pre-converter, which is to say the surface that is defined by the perforated outer casing of the pre-converter, grows smaller.

Miscellaneous Amendments

By the present amendment, claims 6 and 16 have been amended to delete the word "internal" before the expression "cross-sectional area" as the word "internal" found no antecedent basis in claims from which those claims depend. Further, claim 9 has been amended to add the word "converter" in the expression "preliminary catalytic device" as it was missing due to a typographical error. For a similar reason, the word "device" was added in more than once instance in claims 21 and 22. Finally, the expression "inlet portion" was changed to "inlet area" in claim 22 for internal consistency throughout the claim.

In view of the above remarks, the Applicants respectfully submit that all of the currently pending claims are allowable and that the entire application is in condition for allowance.

Should the Examiner believe that anything further is desirable to place the application in a better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

At the time of filing of the present response, the Office was authorized to charge the fees believed to be necessary to a credit card. In case of any under- or over-payment or should any additional fee be otherwise necessary, the Office is hereby authorized to credit or debit (as the case may be) Deposit Account number 502977.

Respectfully submitted,

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